MECHATRONICS BOOK SERIES SYSTEM DESIGN AND SIGNAL PROCESSING

VOLUME 1

Editors
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Amir Akramin Shafie
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CONTENTS

CHAPTER 11

Design and Development of Intelligent Wiper for Vehicle Windshield: Final Assembly and Results

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11.1 Introduction

Today, almost all automobiles are equipped with windshield wiper, often by legal requirement. Clear vision for the car driver is an important prerequisite for safety in road traffic during rainy days. The wiper faithfully keeps the windscreen clear, moving back and forth across the windscreen countless times as it sweeps the water away. However the traffic accidents occur quite frequently during rainy condition on the roadways. [1] reported that the observed traffic flow during dry and wet periods has shown that traffic flow decreased during rainfall. Accident related studies in the wet weather have reported the increase of accident rates and attributed 31% of injuries due to wet weather [2]. The study recognized degraded pavement condition and poor visibility as the major safety concern in the wet weather. In addition 71% of crash rate and 49% of injury rate on highways is due to rain [1]. All these showed that accident and traffic flow are negatively related during rain fall.

Driving becomes hazardous as the rain disturbs the driver's view. The driver's vision is disturbed by the rain droplets and driver's eyes of sight are decreased. At this time, driver's reaction time is extremely important during these rainy days [3]. As a few factors come together like decreased in visibility, decreased field of vision, unfamiliar driving conditions and reduced lighting along the road, any distraction occur at this moment will increases the possibility of an accidents. Any action which needs a driver to refocus the driver's visual reference from outside to inside the vehicle, to do mental calculations, or to do any additional manipulative steps during driving, increases the risks of an accident.

11.2 The Controller Box

In the previous Chapter 9 and 10, the designs of a smart water collector and the electrical circuitry have been thoroughly discussed respectively.

All circuits are embedded inside controller box as shown in Fig. 11.1. At the front side of the controller box there are option switch to selected either manual or automatic mode. If the manual mode is selected, the four adjacent push buttons can be used to select the desired wiper speed.

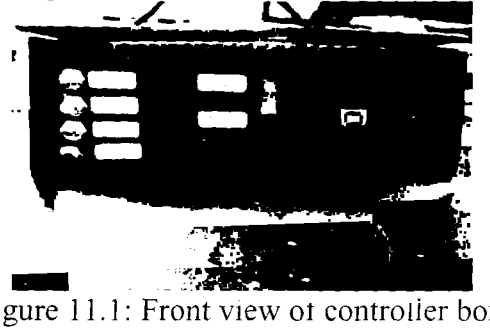

Figure 11.1: Front view of controller box

The intelligent wiper system uses tree power supplies which are *Topward* Dual Tracking DC Power Supply and two *Teletron* AC-DC coverter adapter power supplies. *Topward* Dual Tracking